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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
FAN, CHIEH M	

ART UNIT	PAPER NUMBER
2634	12

DATE MAILED: 12/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/251,297	LARRICK ET AL.	
	Examiner	Art Unit	
	Chieh M Fan	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-12,14-27* is/are rejected.

7)☒ Claim(s) *13 and 28* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claims 25-28 are objected to because of the following informalities:

"attenuating the echo" in line 3 of claim 25 should be changed to --- attenuating an echo --- and "produced by an echo" in line 4 of claim 25 should be changed to --- produced by the echo ---;

or

"attenuating the echo" in line 3 of claim 25 should be changed to --- attenuating the reflected pulse --- and "produced by an echo" in line 4 of claim 25 should be changed to --- produced by the reflected pulse ---;

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2 and 14-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The examiner feels he did not make the reason of rejection clear in the previous Office Action. The examiner hereby rephrases the ground of rejection as the following. Claim 2 recites the limitation "said impulse generator" in line 7, it is not clear the limitation is referred to the limitation "a switched impulse generator" (line 4) or "a UWB impulse generator" (line 5).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 2 and 3 are rejected under 35 U.S.C. 102(e) as being anticipated by McEwan (US Patent 5,521,600).

Regarding claim 2, McEwan teaches a communication system utilizing an ultra-wideband transmitter, said system comprising:

a switched impulse generator (16, 15, 12 in Fig. 1) including one of an impulse-excited oscillator and a UWB impulse generator to generate a low-level ultra-wideband signal;

a filter (17, 10 in Fig. 1) responsive to said switched impulse generator;

an antenna (11 in Fig. 1) responsive to said filter to radiate a representation of said ultra-wideband signal; and

a receiver (21, 22, 23, 24, 25, 26, 27, 33 in Fig. 1) for receiving said radiated ultra-wideband signal.

Regarding claim 3, McEwan teaches a method for detecting an object utilizing ultra-wideband transmitting techniques, said method comprising:

generating a switched impulse, low-level ultra-wideband signal (16, 15, 12 in Fig. 1);

filtering said switched impulse, low-level ultra-wideband signal (17, 10 in Fig. 1);

radiating (11 in Fig. 1) upon said object (20 in Fig. 1) a signal representing said filtered, ultra-wideband signal; and

receiving (21 in Fig. 1) an echo of said radiated, waveform adapted, ultra-wideband signal thereby to detect said object (33 in Fig. 1).

6. Claims 2 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Fullerton et al. (U.S. Patent No. 5,677,927).

Regarding claim 2, Fullerton et al. teach teaches a communication system utilizing an ultra-wideband transmitter, said system comprising:

a switched impulse generator (1002, 1006, 1008, 1016, 1018, 1022, 1028 in Fig. 10, col. 14, lines 7-9) including one of an impulse-excited oscillator and a UWB impulse generator to generate a low-level ultra-wideband signal;

a filter (col. 14, lines 17-21) responsive to said switched impulse generator;

an antenna (1030 in Fig. 10) responsive to said filter to radiate a representation of said ultra-wideband signal; and

a receiver (903 in Fig. 9) for receiving said radiated ultra-wideband signal.

Regarding claim 4, Fullerton et al. teach a waveform adaptive ultra-wideband transmitter comprising:

a signal generator to generate a series of discrete low-level ultra-wideband signals having a selectable carrier frequency (1002 in Fig. 10, lines 3-11 of abstract);

a waveform adapter responsive to said low-level ultra-wideband signals and including at least one of a bandpass filter, a mixer, a pulse shaper, and an attenuator that controls one of frequency, pulse shape, bandwidth, phase, multi-level amplitude and multi-level attenuation of said low-level ultra-wideband signals, said waveform adapter controlling said low-level ultra-wideband signals on a dynamic, real-time basis (lines 11-24 in abstract, also see col. 14, lines 17-21).

an antenna responsive to said waveform adapter to radiate said ultra-wideband signals (1030 in Fig. 10).

7. Claims 1-3, 6-9, 14-16 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Ross (U.S. Patent No. 5,455,593).

Regarding claim 1, Ross teaches a range measuring device comprising an ultra-wideband transmitter and receiver, said device comprising:

a switched impulse generator (2, 3 in Fig. 9b) to generator a low-level waveform adaptive ultra-wideband signal;

a filter that filters said low-level ultra-wideband signal to define a center frequency thereof and to produce a filtered low-level ultra-wideband signal (6 in Fig. 9b; note that the center frequency of the filter passband is the center frequency of the signal output from the filter);

an antenna (5 in Fig. 9b or 51 in Fig. 1) responsive to said filter to radiate a signal representing said filtered low-level ultra-wideband signal; and

a receiver (54 in Fig. 1) for receiving said radiated ultra-wideband signal.

Regarding claim 2, Ross teaches a communication system utilizing an ultra-wideband transmitter, said system comprising:

a switched impulse generator (2, 3 in Fig. 9b) including one of an impulse-excited oscillator and a UWB impulse generator to generate a low-level ultra-wideband signal;

a filter (6 in Fig. 9b) responsive to said switched impulse generator;

an antenna (5 in Fig. 9b) responsive to said filter to radiate a representation of said ultra-wideband signal; and

a receiver (54 in Fig. 1 or 48 in Fig. 2) for receiving said radiated ultra-wideband signal.

Regarding claim 3, Ross teaches a method for detecting an object utilizing ultra-wideband transmitting techniques, said method comprising:

generating a switched impulse, low-level ultra-wideband signal (2, 3 in Fig. 9b);

filtering said switched impulse, low-level ultra-wideband signal (6 in Fig. 9b);

radiating (5 in Fig. 9b or 51 in Fig. 1) upon said object (52 in Fig. 1) a signal representing said filtered, ultra-wideband signal; and

receiving (53, 54 in Fig. 1) an echo of said radiated, ultra-wideband signal thereby to detect said object.

Regarding claims 6, 14 and 21, Ross also teaches that the receiver comprises a tunnel diode (54 in Fig. 1) to detect the radiated ultra-wideband signal.

Regarding claims 7, 15 and 22, Ross further teaches an amplifier (7 in Fig. 9b) interposed between the filter and the antenna.

Regarding claims 8, 9, 16, 23 and 24, the filter is a bandpass filter (col. 7, lines 48-50).

Claim Rejections - 35 USC § 103

8. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

9. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over McEwan (U.S. Patent 5,521,600) in view of Ross et al. (U.S. Patent 5,337,054) and Nicolson et al. (U.S. Patent 3,983,422).

Regarding claim 14, as described above with respect to claims 2, McEwan teaches the claimed invention except a tunnel diode is used to detect the ultra-wideband signal. However, a tunnel diode threshold ultra-wideband receiver has been widely used in the art. An example may be seen in Ross et al. (see abstract). Further, Nicolson et al. (US Patent 3,983,422) teaches the use of a tunnel diode in a detector has the advantage of being a device which is commercially available with specified parameters (col. 1, lines 57-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a tunnel diode into the receiver of McEwan for the advantage described above.

Regarding claim 21, as described above with respect to claims 3, McEwan teaches the claimed invention except a tunnel diode is used to detect the ultra-wideband signal. However, a tunnel diode threshold ultra-wideband receiver has been widely used in the art. An example may be seen in Ross et al. (see abstract). Further, Nicolson et al. (US Patent 3,983,422) teaches the use of a tunnel diode in a detector has the advantage of being a device which is commercially available with specified parameters (col. 1, lines 57-60). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a tunnel diode into the receiver of McEwan for the advantage described above.

10. Claims 1, 3, 6-9, 14-16 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al. (U.S. Patent No. 5,677,927) in view of Ross (U.S. Patent No. 5,455,593).

Regarding claim 1, Fullerton et al. teaches an ultra-wideband transmitter and receiver, said device comprising:

a switched impulse generator (1002, 1006, 1008, 1016, 1018, 1022, 1028 in Fig. 10, col. 14, lines 7-9) to generator a low-level waveform adaptive ultra-wideband signal;

a filter that filters said low-level ultra-wideband signal to define a center frequency thereof and to produce a filtered low-level ultra-wideband signal (col. 14, lines 17-21; note that the center frequency of the filter passband is the center frequency of the signal output from the filter);

an antenna (1030 in Fig. 10) responsive to said filter to radiate a signal representing said filtered low-level ultra-wideband signal; and

a receiver (903 in Fig. 9) for receiving said radiated ultra-wideband signal.

Fullerton et al. do not teach that the ultra-wideband transmitter is used in a range measuring device. However, it is well known that a ultra-wideband transmitter is commonly used in a range measuring device because the ultra-wideband transmitter using short pulses in the order of a nanosecond has the capability of providing range resolution and accuracy to fractions of a foot. Ross teaches an ultra-wideband transmitter used in a range measuring device (Fig. 1). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the ultra-wideband transmitter in a range measuring device, so as to have the capability of providing high resolution and accuracy.

Regarding claim 3, Fullerton et al. teach a method utilizing ultra-wideband transmitting techniques, said method comprising:

generating a switched impulse, low-level ultra-wideband signal (1002, 1006, 1008, 1016, 1018, 1022, 1028 in Fig. 10, col. 14, lines 7-9);

filtering said switched impulse, low-level ultra-wideband signal (col. 14, lines 17-21);

radiating (1030 in Fig. 10) a signal representing said filtered, ultra-wideband signal; and

receiving (53, 54 in Fig. 1) said radiated, ultra-wideband signal.

Fullerton et al. do not teach that the ultra-wideband transmitting technique is used in a range measuring device, that is, Fullerton et al. do not teach receiving from an object a reflected object of said ultra-wideband signal thereby to detect said object. However, it is well known that an ultra-wideband transmitter is commonly used in a range measuring device because the ultra-wideband transmitter using short pulses in the order of a nanosecond has the capability of providing range resolution and accuracy to fractions of a foot. Ross teaches an ultra-wideband transmitter used in a range measuring device (Fig. 1). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the ultra-wideband transmitting technique of Fullerton et al. in a range measuring device, so as to have the capability of providing high resolution and accuracy.

Regarding claims 6 and 21, Ross also teaches that the receiver comprises a tunnel diode (54 in Fig. 1) to detect the radiated ultra-wideband signal.

Regarding claims 7 and 22, Ross further teaches an amplifier (7 in Fig. 9b) interposed between the filter and the antenna. It would have been obvious to a person

of ordinary skill in the art at the time the invention was made to use an amplifier to boost up the power of transmitting signals.

Regarding claims 8, 9, 23 and 24, the filter of Fullerton et al. is a bandpass filter (col. 14, line 19), and the passband of the filter defines the bandwidth of the bandwidth of the signal radiated by the antenna.

Regarding claim 14, Fullerton et al. teach the claimed invention (see the rationale applied to claim 2 above), but do not teach the receiver comprises a tunnel diode detector. However, a tunnel diode threshold ultra-wideband receiver has been widely used in the art. The use of a tunnel diode in a detector has the advantage of being a device which is commercially available with specified parameters. Ross teaches an ultra-wideband receiver comprises a tunnel diode detector (54 in Fig. 1 or 48 in Fig. 2). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a tunnel diode into the receiver of Fullerton et al. for the advantage described above.

Regarding claim 15, Ross further teaches an amplifier (7 in Fig. 9b) interposed between the filter and the antenna. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use an amplifier to boost up the power of transmitting signals.

Regarding claim 16, the filter of Fullerton et al. is a bandpass filter (col. 14, line 19).

11. Claims 10-12, 17-19 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ross (U.S. Patent No. 5,455,593) in view of Cronson et al. (U.S. Patent No. 4,688,042).

Regarding claims 10, 11, 17, 18, 25 and 26, Ross teaches the claimed invention (the rationale applied to claims 1 above for claims 10 and 11; see the rationale applied to claims 2 above for claims 17 and 18; and the rationale applied to claims 3 above for claims 25 and 26) except a variable attenuator coupled between the receiving antenna and the tunnel diode detector. Cronson et al. teach providing a variable attenuator between the receiving antenna and the tunnel diode detector so as to minimize the susceptibility of jamming (col. 2, lines 25-30; col. 1, lines 12-15). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple a variable attenuator between the receiving antenna and tunnel diode detector, so as to improve the detection capability in a jamming environment.

Regarding claims 12, 19 and 27, Ross further teaches a controller that controls the variable attenuator to enable the detector to discriminate between noise and information signal (col. 3, lines 54-64).

12. Claims 10-12, 17-19 and 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al. (U.S. Patent No. 5,677,927) in view of Ross (U.S. Patent No. 5,455,593) as applied to claims 1, 3 and 6 above, and further in view of Cronson et al. (U.S. Patent No. 4,688,042).

Regarding claims 10, 11, 17, 18, 25 and 26, Fullerton et al. in view of Ross teach the claimed invention (see the rationale applied to claims 1 above for claims 10 and 11; see the rationale applied to claims 6 above for claims 17 and 18; and the rationale applied to claims 3 above for claims 25 and 26) except a variable attenuator coupled between the receiving antenna and the tunnel diode detector. Cronson et al. teach providing a variable attenuator between the receiving antenna and the tunnel diode detector so as to minimize the susceptibility of jamming (col. 2, lines 25-30; col. 1, lines 12-15). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to couple a variable attenuator between the receiving antenna and tunnel diode detector, so as to improve the detection capability in a jamming environment.

Regarding claims 12 and 27, Ross further teaches a controller that controls the variable attenuator to enable the detector to discriminate between noise and information signal (col. 3, lines 54-64).

Response to Arguments

13. Applicant's arguments filed 10/11/03 have been fully considered but they are not persuasive.

The applicants argue that McEwan is modulating the RF oscillator with a square wave. This results in a two-frequency output – a low frequency output when the square wave is at its low point and a high frequency output when the square wave is at its

maximum. This is not equivalent to filtering a UWB pulse as meant by applicants' claims at issue since, among other things, no realizable causal filter can be made having that kind of response (see pages 3-4 in the amendment).

Examiner's response --- The applicants are reminded although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Claims 2 and 3 only recite a filter or a step of filtering. The applicants are also reminded that the examiner is entitled to give the broadest reasonable interpretation to the language of the claims. The examiner is not limited to the applicant's definition which is not specifically set forth in the claims. See *In re Tanaka et al.*, 193 USPQ 139, (CCPA) 1977. In fact, as explained in the last Office Action, the examiner interpreted the term "filter" exactly following the applicants' definition, "the filter or filtering limitation is being understood to embrace devices and methods that limit, alter, or control the frequency or frequency range of the emitted UWB signal". Moreover, in response to the applicants' argument that no realizable causal filter can be made having that kind of response, an adjustable bandpass filter can generate such response.

Allowable Subject Matter

14. Claims 13, 20 and 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims. Claim 20 also needs to overcome the rejection under 35 USC 112, second paragraph above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

Chieh M Fan
Primary Examiner
Art Unit 2634

cmf
December 23, 2003